

minutes), destroy the leukocytes. Rapid freezing and maintenance of the milk at -70°C will not destroy the cells if the milk is appropriately thawed, but few nurseries have the facilities for rapid freezing.

Freezing and lyophilization greatly decrease the concentration of IgG and IgM, but have little effect on the concentration and function of IgA, which is present in great quantities in human milk. Pasteurization decreases the concentrations of IgG and IgM to a lesser extent, but to a greater extent with IgA than does freezing and lyophilization. Sterilization inactivates all immunoglobulins, as well as all lipases contained in human milk—which are necessary for the rapid digestion and absorption of fat in the milk.

The ideal method of collecting human milk consists of the mother carefully washing her hands and cleansing her breasts, and manually expressing her milk rather than using a mechanical device. After the first 5 ml is discarded, the milk is collected in a plastic container and given directly to the infant. The milk may be refrigerated for as long as 48 hours, but it is preferable to use it within four hours. If there is a delay, the milk should be frozen or lyophilized. The milk should also be cultured intermittently to evaluate the techniques of collecting and processing.

PHILIP SUNSHINE, MD

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The Down Syndrome

THE DOWN SYNDROME is one of the most common birth defects, occurring in one in every 1,000 newborn infants in all racial groups. More than 95 percent of the affected infants have trisomy 21; the remainder have either translocation of the extra chromosome 21 to another chromosome or another abnormality such as mosaicism. Using the new chromosome-banding techniques, it has been shown that about 25 percent of the infants with trisomy 21 have derived the extra chromosome from the father, but this is unrelated to the age of the father. Trisomy 21 does show a correlation with maternal age; an older mother is much more likely to have an affected child than a younger mother. Because fewer older women are having children now than in the past, most

(80 percent) of the infants with trisomy 21 are being born to women younger than 35 years old. Prenatal diagnosis by amniocentesis should be discussed as an option for each pregnant woman 35 or older. Another recent finding made possible by banded karyotypes is the determination that only the distal long arm of chromosome 21 needs to be present in triplicate, not the entire chromosome 21, to cause the infant to have the phenotypic features of the Down syndrome.

LEWIS B. HOLMES, MD

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PCP Update

ABUSE OF PHENCYCLIDINE (PCP) and its related overdose has become widespread in the United States, particularly in the 12 to 21 year age group. It is essential that pediatricians become familiar with the newly described clinical presentations and treatment for this common emergency problem.

Since PCP's first appearance in 1967, the patterns of use, abuse and clinical presentation have increased significantly. The National Center on Drug Abuse estimates that approximately 6 percent of persons between 12 and 17 years old and 14 percent of those 18 to 25 have used PCP. Its use as a drug of choice taken daily has increased dramatically and it is now one of the most popular of illicit drugs (7 million users in the United States).

Although the drug can be injected, ingested, sniffed or smoked, the pattern of use has changed from ingestion of the drug to smoking it by sprinkling it on some leafy mixture.

Most experienced users have become skilled at controlling their dose so that the effects are not serious enough to warrant medical attention. Frequent overdoses do occur, however, because the potency in street drugs and the tolerance of the drug by patients vary greatly.

Depending on the dose and the stage at which the person is seen, PCP overdose can produce an enormous array of symptoms. These can range from agitation, uncoordination, muscle rigidity,

nystagmus, loss of pain sensation and blank staring when the drug is taken in low doses to prolonged coma, hypersalivation, hypertension, convulsions, opisthotonos and death in high doses. Extremely disturbing behavioral effects are also seen both in low-dose toxicity and during recovery from severe overdoses. They may be very bizarre, paranoid and violent and place the patient at great risk for accidents (falling from high places, drowning, assaults, homicide). Most phencyclidine-associated deaths have occurred in this manner.

Some of these behavioral manifestations or a classic schizophrenic syndrome may also occur with chronic low-dose use or as a delayed phenomenon weeks later after a single dose. Young patients presenting with schizophrenia without a previous history of psychiatric disturbance should be evaluated for PCP toxicity.

Unfortunately, measurable quantities of PCP in blood and urine are often not found in these patients although PCP is present in the brain as a result of lipid storage and reabsorption from the stomach.

The current approach to treatment developed by Alan Done at Children's Hospital of Michigan is based on the principles of ion trapping of weak bases and acids. PCP, a base, will be trapped in an acid medium. Because cells are more acid than extracellular fluid, PCP is trapped in cells. By acidifying the patient, PCP can be shifted from the cells (such as in the brain) to the extracellular fluid and excreted in the urine.

Acidification can be accomplished by administering the following:

- Ammonium chloride, 2.75 mEq per kg of body weight every six hours by nasogastric tube (carry out continuous gastric suction between doses to remove recirculated PCP and adjust gastric losses by giving appropriate fluids intravenously);
- Ammonium chloride intravenously as 1 percent solution in saline to bring blood pH intermittently to 7.3 and urine to less than 5;
- Cranberry juice and 2 grams of ascorbic acid orally four times a day for mild symptoms or low-dose toxicity.

Frequent monitoring of pH and serum osmolality is essential.

In addition, furosemide (Lasix), 20 to 40 mg given intramuscularly or intravenously, should be administered when urine pH falls below 5.

Other symptomatic treatment consists of appropriate airway management and assisted ventilation; diazoxide, 2 to 5 mg per kg of body weight given intravenously for hypertension; diazepam (Valium), 2 to 6 per sq meter given intravenously for seizures; haloperidol (Haldol) for severe psychosis.

Because these patients are difficult to manage, physicians should contact their regional poison center and its medical toxicologist for consultation or transfer.

SYLVIA MICIK, MD

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Use of Pneumococcal Vaccine

FULMINANT SEPSIS and meningitis caused by *Streptococcus pneumoniae* occur with increased frequency in children with sickle-cell anemia and nephrotic syndrome, and children after splenectomy. Age and the reason for removal of the spleen correlate with the incidence of overwhelming sepsis. After splenectomy, this risk is lowest (but real) in normal children in whom the procedure has been done because of trauma and highest in 4-year-old or younger children and those with hematological disorders affecting the reticuloendothelial system. Children with biliary atresia and cirrhosis are also at high risk for fatal infections of sudden onset, as are neutropenic patients. In addition, at least 20 percent of normal children have one or more attacks of otitis media caused by *S pneumoniae*.

The pneumococcal vaccine which has recently been released for use contains 14 serotypes. Tentative decisions must be made as to the proper role of this vaccine in the care of children. The vaccine contains the following types according to the American typing system: 1-4, 6, 8, 9, 12, 14, 19, 23, 25, 51 and 56. Because Danish typing sera are more readily available, the Danish nomenclature is used in most reports which specify the serotypes causing infection in children. Danish serotypes 7 and 18 correspond to American types 51 and 56.

Adults and children differ with regard to the frequency of infections with specific serotypes. The vaccine stimulates an antibody response only to the capsular polysaccharides which it contains. Studies suggest that 85 percent of pneumococcal bacteremia in children is caused by serotypes contained in the present vaccine. Two serotypes, 11 and 15, which commonly colonize children are